

# A Novel Low-cost, Ka-band, High Altitude, Multi-Baseline Unmanned Aerial Vehicle Sensor for Surface Water Ocean Topography, Phase II

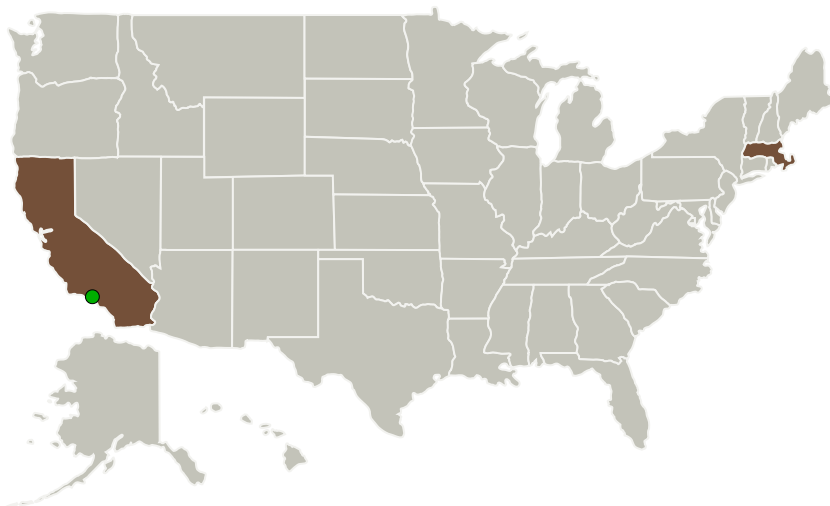
Completed Technology Project (2010 - 2012)



## Project Introduction

This proposal presents the Ka-band SWOT Phenomenology Airborne Radar (KaSPAR) to support the surface water ocean topography (SWOT) mission for science and algorithm development and calibration and validation. KaSPAR is a modular system with multiple temporal and cross-track baselines to fully characterize the scattering and statistics expected from SWOT, provide data for developing classification algorithms, and understanding instrument performance and limitations over the vast variety of scenes that SWOT will encounter (ie sea-ice, vegetation covered water, frozen/partially frozen rivers etc). Furthermore a wide-swath (>5km) high-accuracy elevation mapping capability provides the necessary framework to translate traditional point or profile calibration/validation measurements to the spatial framework that SWOT will measure. Beyond SWOT, KaSPAR's unique 4D imaging capability (2D intensity, elevation and velocity mapping) can be uniquely applied to topography applications, local water resource management and monitoring, weather reconnaissance (e.g. floods & storm surge), electronic vision applications and much more. The Phase II activities will build out a complete multichannel radar system to realize the potential of KaSPAR. Key developments include the highly phase-stable high-bandwidth receivers, low-sidelobe antennas and integration with a high power (40W) solid-state power amplifier. The modular, compact design will be compatible between platforms and is directly compatible without modification with two NASA King Air aircraft. Long-term KaSPAR is designed to support unpressurized high altitude operations.

## Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Remote Sensing Solutions, Inc.	Lead Organization	Industry	Barnstable, Massachusetts
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Massachusetts

## Project Transitions

**March 2010:** Project Start

**December 2012:** Closed out

### Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138750>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Remote Sensing Solutions, Inc.

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

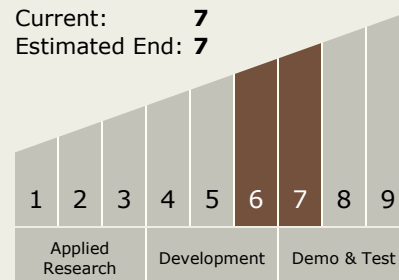
Carlos Torrez

### Principal Investigator:

Delwyn K Moller

## Technology Maturity (TRL)

Start: 6  
Current: 7  
Estimated End: 7



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## Technology Areas

### Primary:

- TX08 Sensors and Instruments
  - └ TX08.1 Remote Sensing Instruments/Sensors
    - └ TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System